Getting the Most from 3500
Alarm and System Event Lists

Authored by:

Jeff Rudd

Project Applications Engineer
Bently Nevada Corporation
e-mail: jeff.rudd@bently.com

When we designed the 3500 Series Machinery Protection System in the mid-1990s, we addressed a number of frequently requested capabilities that were not available in our previous monitoring systems. One of those was the ability for the monitoring system to act as a "flight recorder," capturing and time-stamping alarm and other event particulars. In this article we review 3500's *Alarm Event List* and *System Event List* capabilities, helping to ensure that new and existing users are aware of these features and derive maximum benefit from them.

The Need – Sequence of Event Determination

During a machine shutdown or process upset, single or multiple pieces of equipment may affect (or be affected by) the operations of numerous other machines or process conditions, and an avalanche of alarms can occur nearly simultaneously. In order to reconstruct "what went wrong," it is necessary to know the types of alarms and the order in which they occurred. Sometimes, alarms occur only a few milliseconds apart, but the order in which they occur is critically important in establishing cause and effect. To address these needs, customers adopted the habit of individually wiring alarm outputs from numerous systems (vibration monitors, overspeed systems, compressor surge controllers, etc.) into elaborate Sequence of Events (SOE) recorders. While these systems can be effective, they are both expensive and require extensive wiring. They require all plant alarm and shutdown systems to be equipped with contact closure outputs (i.e., relays), and these must all be wired into the SOE recorder. Customers desired a more distributed system whereby each alarming or protective system (such as a vibration monitoring system) would have on-board capabilities for capturing alarm events and giving them a time stamp using an internal clock synchronized to a master clock somewhere within the plant. Then, information from the various "alarm lists" throughout a plant could be accessed using digital communications and combined with one another; namely, what type of alarm, what time it occurred, and where it occurred.

Managing the Machine – 3500 Alarm Event List

Our 3500 Series Machinery Protection System provides the capability described above with an Alarm Event List, able to capture and retain the most recent 1000 alarms as a standard feature. The *Alarm Event List* contains the date and time of occurrence, in addition to the specific rack slot and channel number involved. Information is also retained specifying if a channel "*Entered*" or "*Left*" an alarm or NOT OK condition, as well as the time and date of a relay that was activated or deactivated. This *Alarm Event List* is retained within the 3500/20 Rack Interface Module where it can be transmitted to appropriate Bently Nevada software (such as 3500 Operator Display), supplied to a 3500/93 LCD display, or output to external process control and automation systems
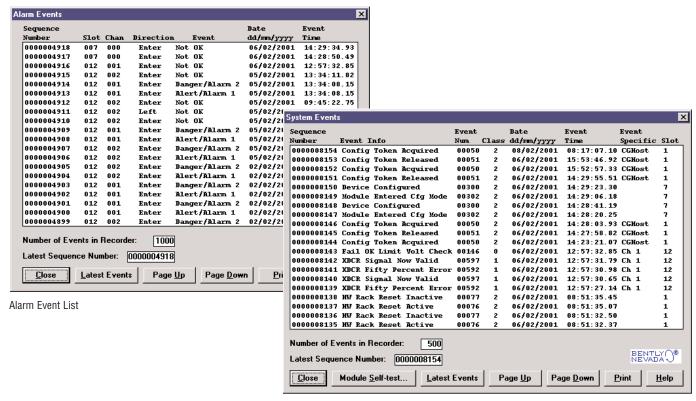
using digital communications from our 3500/92 Communications Gateway module. In addition, the 3500 System's internal clock can be remotely set, allowing you to synchronize with a master clock.

Managing the Instrument – 3500 System Event List

Managing your machinery requires the ability to differentiate among and synchronize alarms from various systems, and is addressed by the 3500 *Alarm Event List* as discussed above. Managing your 3500 instrumentation is another important need and requires its own specialized list with an accurate record of instrument-related activity. The 3500's *System Event List* is designed to address these requirements. Like the *Alarm Event List*, the *System Event List* also resides in the 3500/20 Rack Interface Module. It contains information about a variety of 3500 system-related tasks such as rack configuration mode entry, monitor self-test errors, communication errors, monitor module removal, trip-multiply activation, software switch changes, configuration password changes, and numerous voltage checks throughout the rack. In addition to a description of the event, the time, date, severity class code, and rack

slot location are also included in each individual *System Event List* record. The list is continually updated so that the 400 most recent system events are retained.

Summary

Use of 3500's event lists give you "flight recorder" capabilities for managing both the 3500 rack and the machine(s) to which it is connected. These event lists are standard in every 3500 System and represent numerous options for sharing information with various people in your plant, whether machinery engineers via Bently Nevada software such as Data Manager® 2000, operators via communications with their process control systems, or instrument personnel via 3500 configuration software or dedicated display options. If you are already a 3500 user, consider how you can make use of these event lists to provide even more value to your organization. If you are considering the purchase of a machinery protection system, you'll appreciate the added flexibility and capabilities 3500 offers with standard features like our events lists. More than ever, it makes Bently Nevada's 3500 System the right choice for protecting and managing your machinery. ↺

Alarm Event List

System Event List